

1966 OPERATING SUMMARY

MOORE TOWNSHIP
(Corunna)

**water pollution
control plant**

MOE
WPCP
MOO
ATJA

1966

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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

Members of the Moore Local Advisory Committee,
Township of Moore.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the
Moore Township Water Pollution Control Plant, OWRC Project No. 61-S-
88.

It is hoped that our joint participation in efforts to combat water pollution
will have even more success in the coming year.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly".

D. S. Caverly,
General Manager.

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NOV 23 1967

ONTARIO WATER
RESOURCES COMMISSION

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ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET
TORONTO 5

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VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Moore Township Water Pollution Control Plant, OWRC Project No. 61-S-88.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in cursive script, appearing to read "B. C. Palmer".

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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MOORE TOWNSHIP
(CORUNNA)
water pollution control plant

operated for

THE TOWNSHIP OF MOORE

by the

ONTARIO WATER RESOURCES COMMISSION

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Assistant Director:	C. W. Perry
Regional Supervisor:	A. C. Beattie
Operations Engineer:	P. J. Osmond

801 Bay Street Toronto 5

'66 REVIEW

The total operating cost for 1966 was \$11,851.63, resulting in a slight decrease in the cost per million gallons treated over the 1965 cost. The 1965 costs were higher than the 1966 costs due to a large insurance premium payment in 1965. The overall cost per family decreased by \$0.51 for the year.

In general, operation of the plant was similar to that in previous years. The low flows and loading have continued to make use of more than one half of the plant unnecessary. The spare aeration tank was used for aerobic sludge digestion most of the year. The method of operation was changed to the conventional total oxidation process late in the year.

The average daily flow to the plant was 85,000 gallons per day representing 26.5% of the total design capacity and 53% of the capacity of the portion of the plant in use. It is obvious from the high flows approaching the design flow that occur during periods of heavy rain, that there are numerous storm water connections to the sewers. More strict enforcement of the town sewer use bylaws will be necessary if these storm flows create an operating problem.

The raw sewage average strengths of 170 ppm BOD and 196 ppm SS were slightly below the 1965 averages. Average reductions of 94.5% BOD and 91% SS were achieved. An average of 4.9 cubic feet of grit was removed per million gallons of sewage. This grit removal rate is above average.

The annual inspection of the sewer system during the early fall months did not disclose any problems. One plugged lateral created a small maintenance problem late in the year.

The Corunna plant is operated by one operator. It is possible for one capable operator, with supervision and technical assistance from the OWRC head office staff, to maintain and efficiently operate a project of this size. A part-time assistant is used for weekend relief, holidays, sickness, attendance at training courses, or when additional assistance is required for inspecting and cleaning sewers.

Supervision of the plant is based on a total of 40 hours per week, 36 hours occurring during the period from Monday to Friday inclusive and two hours each on Saturday and Sunday.

During the past year Mr. Bechard successfully completed the third of three courses sponsored by the Ontario Water Resources Commission for sewage plant operators. He also attended the Chief Operators Conference held in Toronto in October 1966.

PROJECT COSTS

NET CAPITAL COST (Estimated)	\$762,379.92
DEDUCT - Portion Financed by CMHC (Estimated)	<u>300,550.70</u>
Long Term Debt to OWRC	<u>\$461,829.22</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966	\$ <u>30,075.97</u>
Net Operating	\$ 11,851.63
Debt Retirement	9,320.00
Reserve	4,609.33
Interest Charged	<u>25,972.34</u>
TOTAL	\$ <u>51,753.30</u>

RESERVE ACCOUNT

Balance at January 1, 1966	\$ 10,378.67
Deposited by Municipality	4,609.33
Interest Earned	656.41
	\$ <u>15,644.41</u>
Less Expenditures	<u>1,015.46</u>
Balance at December 31, 1966	\$ <u>14,628.95</u>

MONTHLY OPERATING COSTS

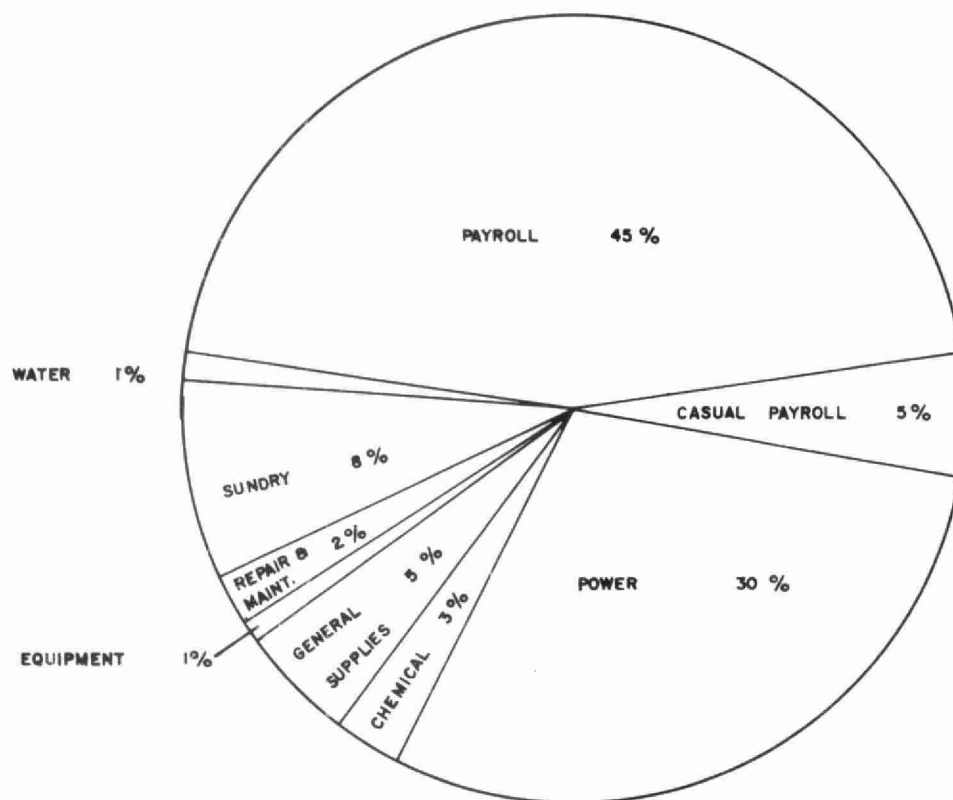
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER
JAN	713.30	413.47	3.66	266.96		29.21				
FEB	701.56	389.90		252.02		4.75		23.00	31.89	
MARCH	994.94	404.10		356.60	106.22	88.76		24.57	12.69	
APRIL	877.52	613.25		173.38		29.57	21.63		12.31	27.33
MAY	835.67	425.17	73.20	167.78		34.43		27.33	87.76	
JUNE	884.27	443.67	49.41	175.28		35.73	55.12		97.60	27.38
JULY	892.15	396.98	98.80	195.63		137.00			61.74	
AUG	966.50	428.56	82.50	181.18	106.29	54.51		66.33	25.13	
SEPT	1854.05	618.50	229.80	932.11		31.22			15.04	27.38
OCT	1168.43	415.36	19.80	259.08		4.40		83.70	386.09	
NOV	988.82	415.36	51.10	292.28	106.29	36.69		30.74	54.36	
DEC	974.42	415.36	5.40	276.88		34.69			154.71	27.38
TOTAL	11851.63	5381.68	613.67	3551.18	322.00 *	570.96	76.75	275.67	949.40	109.52

YEARLY OPERATING COSTS

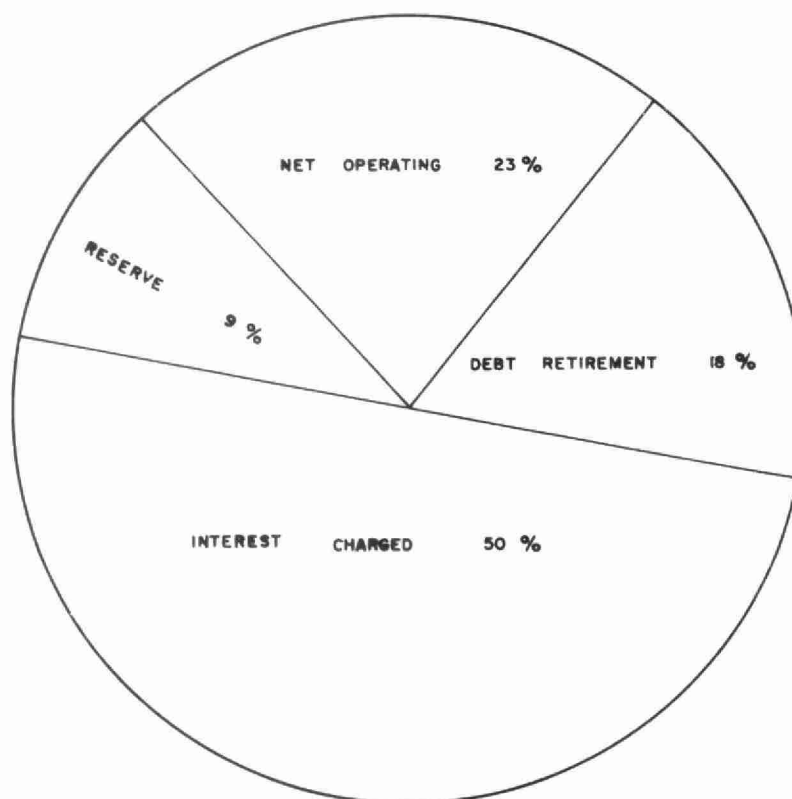
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1964	32,020	\$ 10546.67	* \$ 7.22	\$ 329.38	17 CENTS
1965	32,622	12595.65	8.58	386.11	21 CENTS
1966	31,102	11851.63	8.07	381.06	24 CENTS

* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

1966 OPERATING COSTS



TOTAL ANNUAL COST



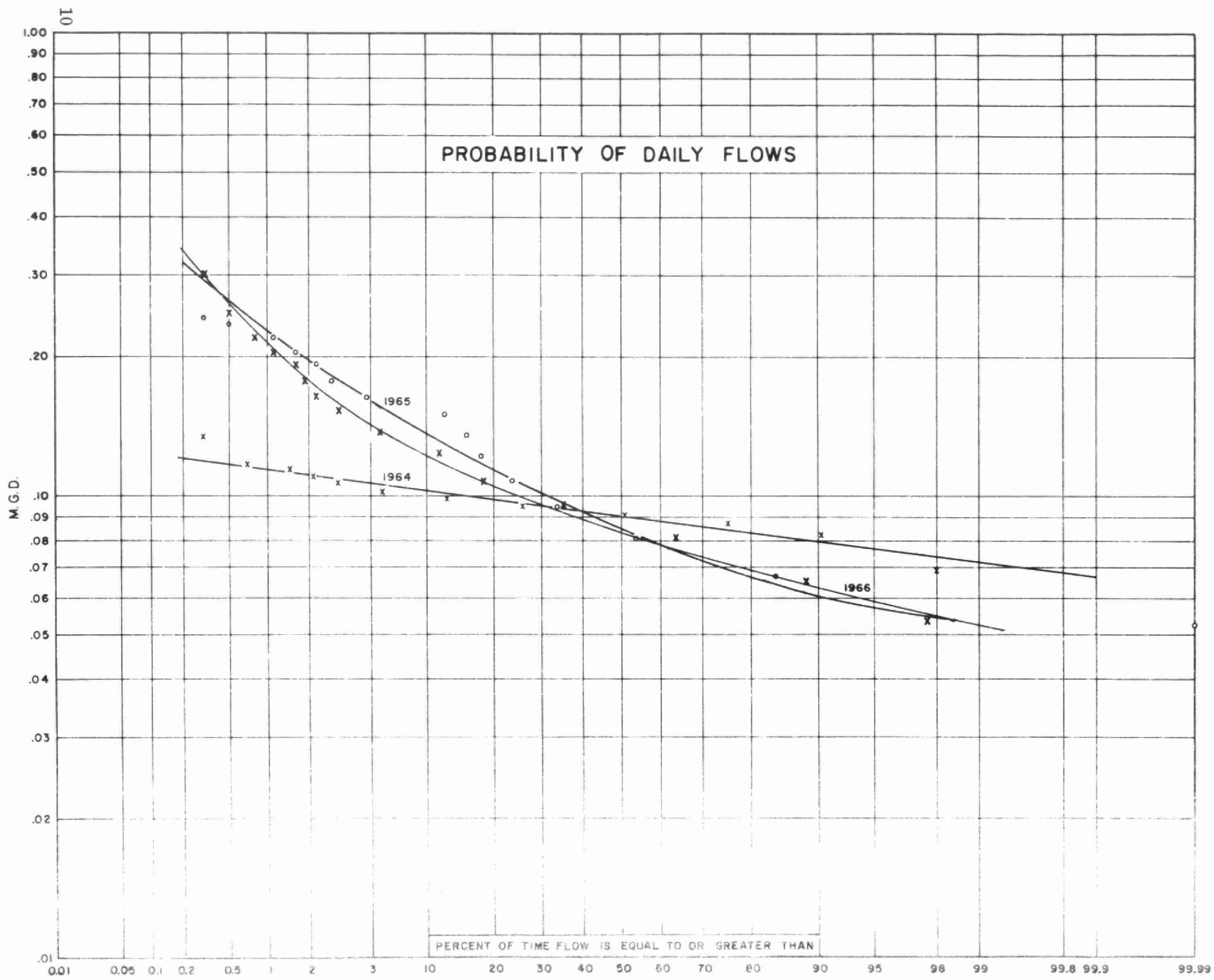
Process Data

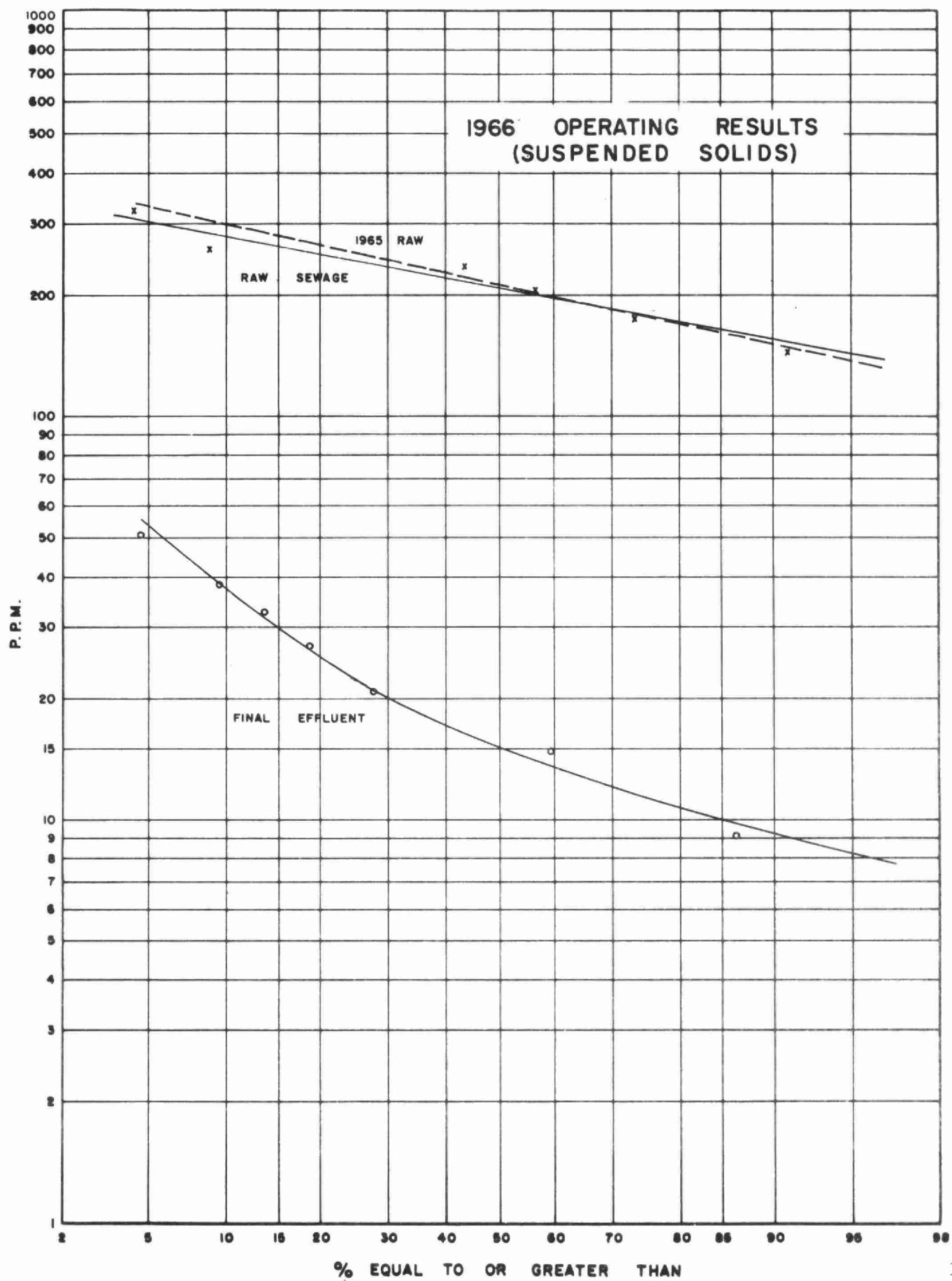
GENERAL

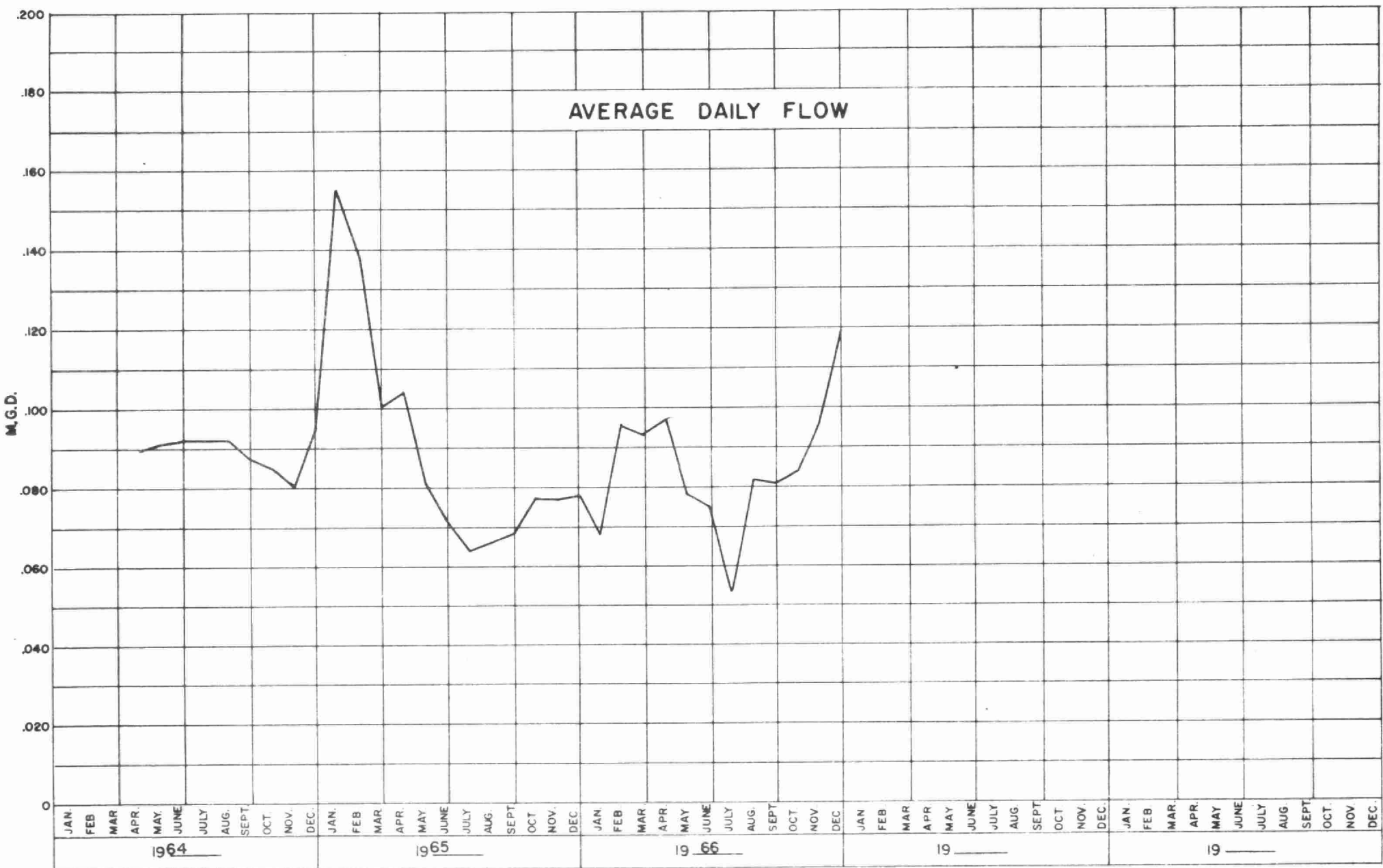
The following data provide information regarding the flows treated by the plant, the degree of treatment achieved and the chlorine required for disinfection.

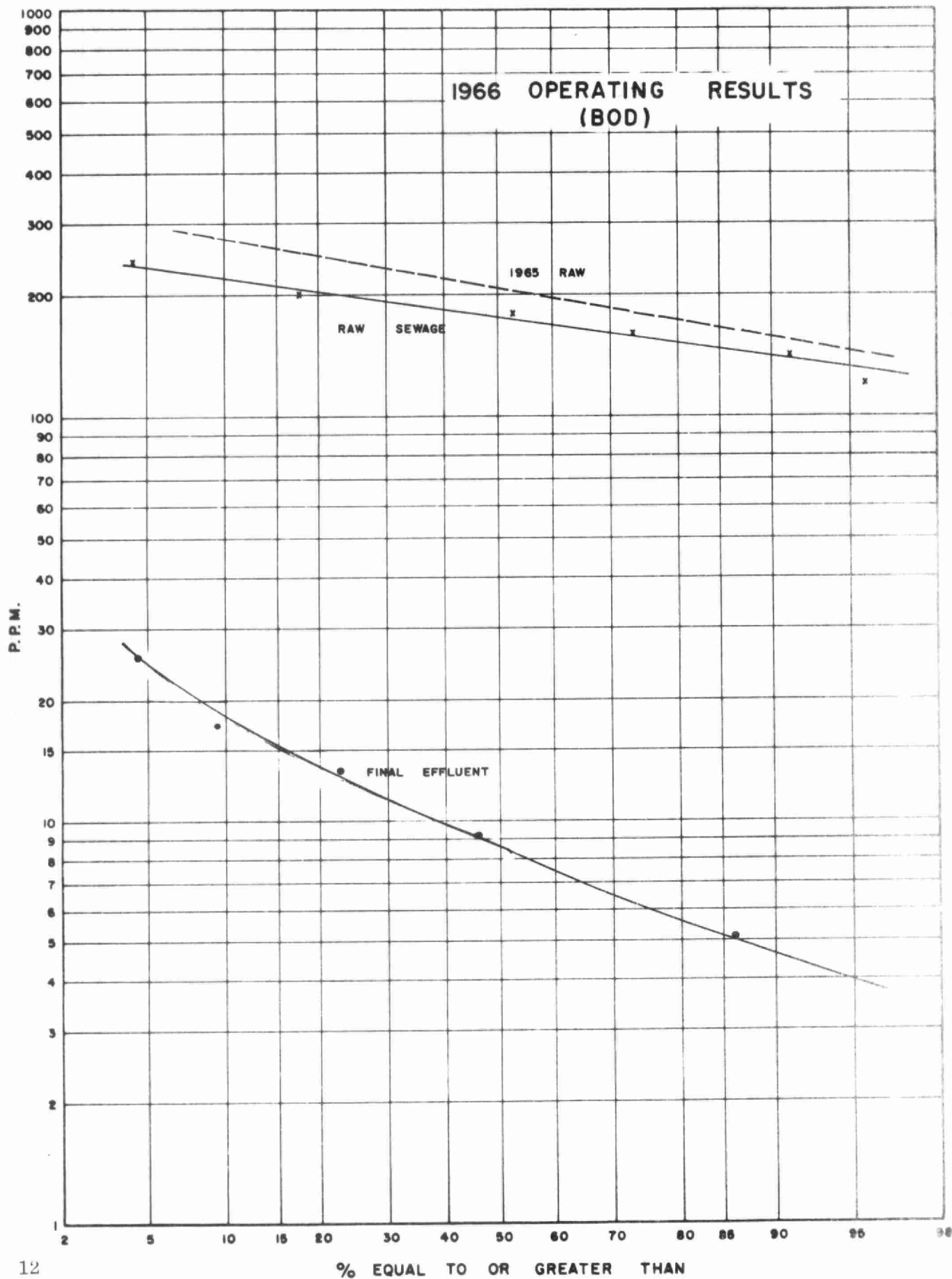
FLOW

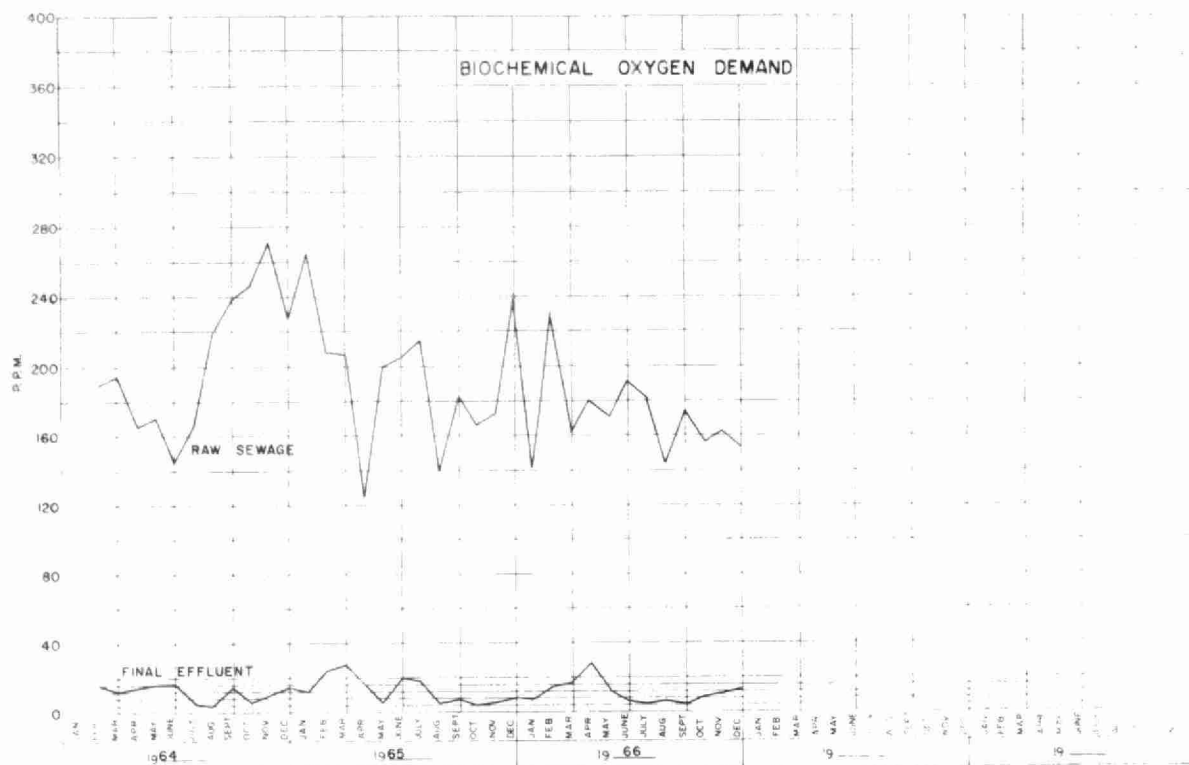
During 1966, a total of 31.102 million gallons was treated at the plant. This represents an average daily flow of 85,211 gallons per day. The maximum average daily flow received was 300,000 gallons on December 7. This particularly high flow was due to severe rains during the day. The maximum flow for one month was 3.233 million or 120,000 gallons per day and occurred in December. Based on the month of December the plant operated at 37.5% of design capacity. On the basis of the year's average flow the plant operated at 26.5% of design capacity. It was necessary to by-pass part of the flow during heavy rains for a total of 36 hours during the year. This action was taken to prevent washout of the activated sludge.



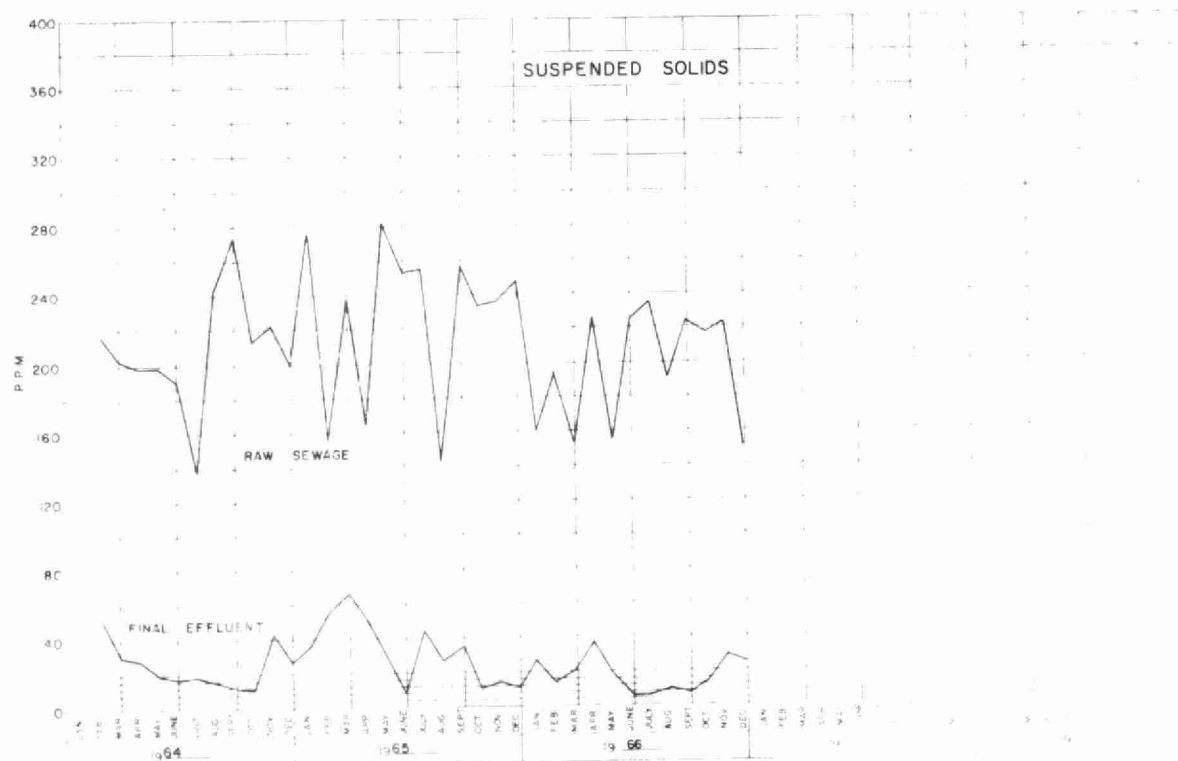








MONTHLY VARIATIONS

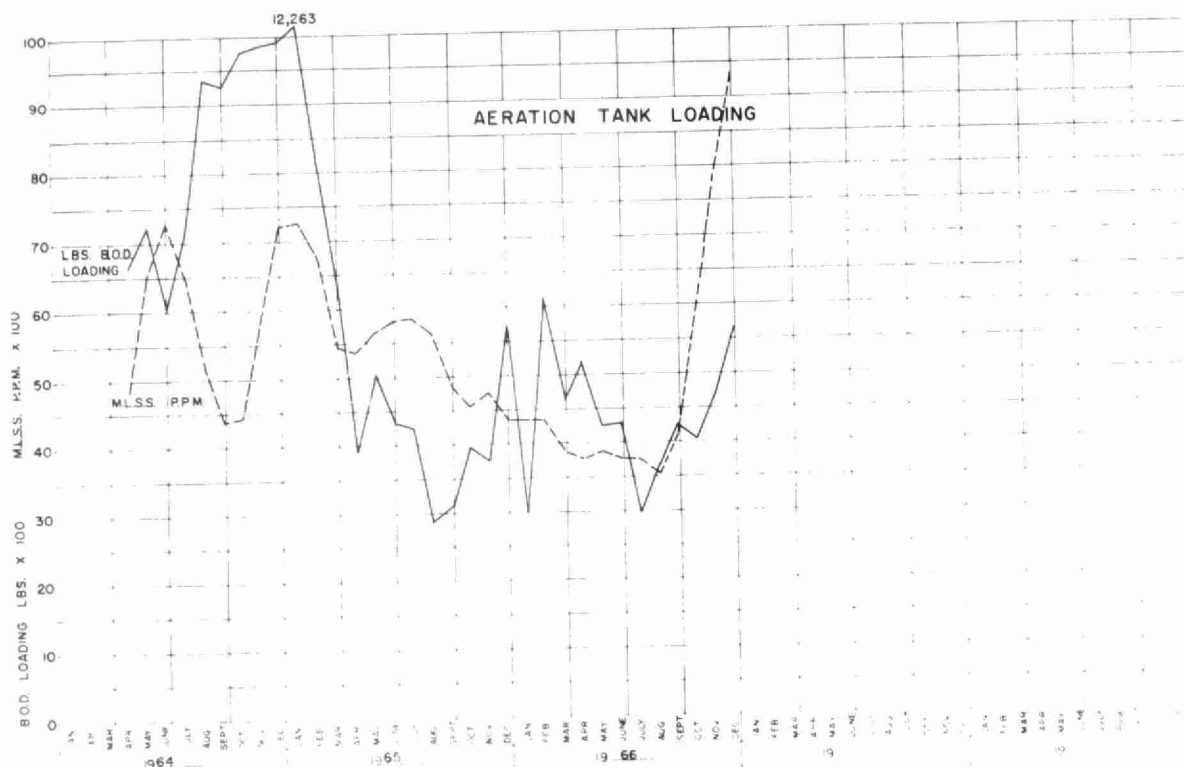
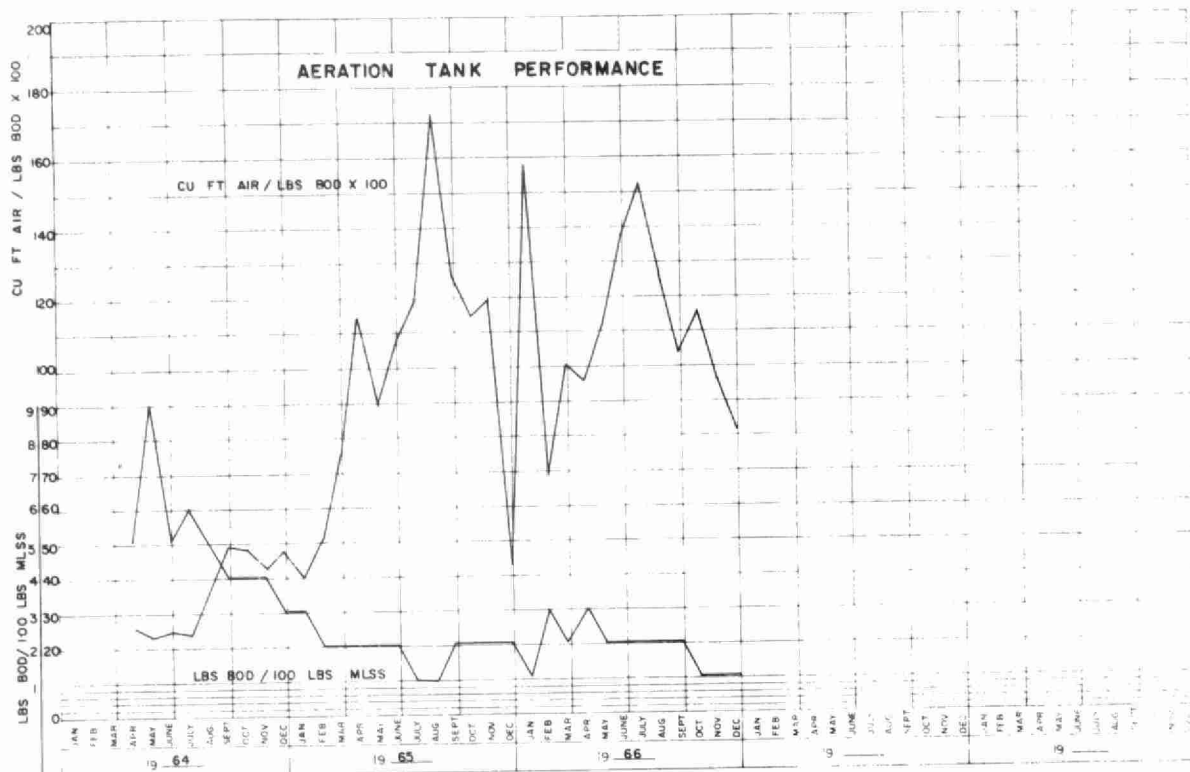


GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	140	6.4	95.5	1.4	160	26	84.0	1.4	12
FEB.	230	12	94.5	2.9	198	14	93.0	2.4	13
MAR.	160	14	91.0	2.1	153	21	86.5	1.9	16
APR.	180	26	85.5	2.2	226	39	82.5	2.7	13
MAY	175	10	94.3	2.0	154	19	87.5	1.6	11
JUNE	191	5	97.5	2.1	225	6	97.5	2.4	24
JULY	180	3	95.8	1.4	235	6	97.5	1.9	9
AUG.	143	4	97.0	1.8	190	8	96.0	2.3	9
SEPT.	173	2	99.0	2.1	224	7	97.0	2.6	9
OCT.	155	7	95.5	1.9	217	14	93.5	2.6	10
NOV.	162	8	95.0	2.2	222	29	87.0	2.8	11
DEC.	152	11	92.5	2.6	148	26	92.5	2.3	14
TOTAL	-	-	-	25.0	-	-	-	27.7	151
AVG.	170	9	94.5	2.1	196	18	91.0	2.3	13

COMMENTS

There has been a slight decrease in the strength of the raw sewage from the 1965 values. The average BOD was 193 ppm and the suspended solids average 228 ppm in 1965. The effluent quality has improved greatly over the 1965 values of 13 ppm BOD and 32 ppm SS. The percent reductions improved accordingly. Grit removal in 1966 increased over 1965 values.



AERATION SECTION

MONTH	* B.O.D. PPM.	MLSS. PPM.	LBS. BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	140	4355	1	15824
FEBRUARY	230	4317	3	6956
MARCH	160	3885	2	10588
APRIL	180	3757	3	9664
MAY	175	3862	2	11163
JUNE	191	3762	2	13714
JULY	180	3728	2	15319
AUGUST	143	3526	2	12631
SEPTEMBER	173	4131	2	10360
OCTOBER	155	5911	1	11612
NOVEMBER	162	7885	1	9600
DECEMBER	152	9408	1	8182
TOTAL	-	-	-	-
AVERAGE	170	4877	2	11301

* Raw BOD, extended aeration plant.

COMMENTS

The increased efficiency of the plant was due to operation of the aeration section at a lower mixed liquor concentration. However, this resulted in excessive waste sludge production. Towards the end of the year, the MLSS were allowed to increase without an appreciable decrease in efficiency of BOD removal. A slight increase in effluent solids occurred due to a higher percentage of inert solids. These changes resulted in operation of the plant in the conventional manner for total oxidation plants, and it is expected that optimum operating conditions will be determined early in 1967.

There has been a 10% increase in the air used per lb. of BOD removed over the 1965 value. This is due primarily to the reduction in BOD concentrations in the raw sewage.

SLUDGE DIGESTION

Month	Sludge to Holding Tank (1000's cu. ft.)	Sludge to Aerobic Digester (1000's cu. ft.)
January	4.25	2.88
February	2.56	2.18
March	4.10	-
April	7.77	-
May	6.92	1.54
June	4.81	2.08
July	4.10	4.81
August	4.74	-
September	2.42	-
October	0.56	-
November	-	-
December	-	-
Total	42.23	13.49

COMMENTS

During part of 1966, one aeration tank was used as an aerobic digester. Activated sludge was wasted to the sludge holding tank where it was decanted and the thickened sludge was pumped to the aerobic digester. The digested sludge was disposed of on the plant grounds. Due to the decreasing capacity of the ground to absorb the digested sludge, and the high cost of hauling sludge, the method of operation was altered toward the end of the year. The aerobic digester was abandoned and the tank was kept in reserve as a spare aeration tank.

Due to the increased MLSS, the waste sludge production was considerably reduced and the holding tank was sufficient for waste sludge storage. The contents of the holding tank are aerated and occasionally thickened by decanting. Final disposal will be achieved by tank truck when required.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	2.113	213	10.08
FEBRUARY	2.652	140	5.28
MARCH	2.882	155	5.38
APRIL	2.908	150	5.16
MAY	2.425	155	6.39
JUNE	2.242	150	6.69
JULY	1.641	155	9.44
AUGUST	2.545	155	6.09
SEPTEMBER	2.443	150	6.14
OCTOBER	2.609	155	5.94
NOVEMBER	2.909	150	5.16
DECEMBER	3.733	155	4.15
TOTAL	31.102	1883	-
AVERAGE	2.592	157	6.05

COMMENTS

Chlorination of the final effluent is carried out 12 months of the year. An average of 157 lbs. of chlorine per month were required (representing a dosage rate of 6.05 ppm) to maintain a residual of at least 0.5 ppm. A check on the 15-minute residual is impossible at this plant since the plant was constructed without a chlorine contact chamber. The end of the outfall is not accessible for sampling.



CONCLUSIONS

During the past year, the efficiency of treatment was greatly improved. Sludge disposal was handled by disposal on the plant grounds; however increased sludge production forced abandonment of this practice. The structures, equipment and grounds were well maintained during the year and no serious breakdowns were encountered. A local garage was rented to store plant equipment.

RECOMMENDATIONS

It is recommended that a facility be constructed on the plant site for storage of lawnmowers, sewer cleaning equipment etc., and to provide a workshop area.

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